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**REMARKS**

Applicant respectfully requests reconsideration and allowance of the subject application. Claims 2, and 40 have been canceled. Claims 1, 3-39, and 41-57 are pending, of which claims 1, 20, 21-28, 37-39, 46-47, 49, and 54 have been amended.

**Replacement Drawings**

Applicant submits herewith a complete replacement set of formal drawings (sheets 1-4) to comply with the examiners objection.

**35 U.S.C. §101 Claim Rejections**

Claims 20, and 37-38 are rejected under 35 USC § 101 as being directed to non-statutory subject matter, specifically non-statutory “computer readable medium” as noted by the Office (*Office Action*, p. 3). The Office argues that lines 23 page 31 to line 8 page 32 of the subject application defines the claimed computer readable medium “as including non-statutory media such as carrier wave, RF, infrared.” The Office further argues that the non-statutory media is “incapable of being touched or perceived absent the statutory medium through which they are conveyed.” Applicant respectfully disagrees with the Office’s argument. Nevertheless, in the interest of advancing the prosecution of these claims, Applicant has amended claims 20, and 37-38 to recite “A tangible computer-readable medium...” As such, claims 20, and 37-38 are allowable. Applicant respectfully requests that the 35 USC § 101 rejection be withdrawn.

1        **35 U.S.C. §103 Claim Rejections**

2        **A.**        Claims 1-13, 15, 20-32, 34, 37-43, 46-51, and 54 are rejected under  
3        35 USC § 103(a) for obviousness over US Patent No. 5,799,173 to Gossler et al.  
4        (hereinafter, "Gossler"), in view of US Patent No. 6,728,748 to Mangipudi et al.  
5        (hereinafter, "Mangipudi") (*Office Action*, p. 2).

6        **B.**        Claims 14, 16-19, 33, 35-36, 44-45, 52-53, and 55-57 are rejected  
7        under 35 USC § 103(a) for obviousness over Gossler in view of Mangipudi and  
8        further in view of US Patent No. 6,321,263 to Luzzi et al. (hereinafter, "Luzzi")  
9        (*Office Action*, p. 6). Applicant respectfully traverses the rejections.

10  
11        Applicant submits that the Office has failed to establish a *prima facie* case  
12        of obviousness in rejecting claims 1-57, and Applicant respectfully traverses the  
13        rejections.

14        **Independent Claim 1** recites a method performed by a control client that  
15        communicates with a load-balancing cluster of server nodes configured to service  
16        application-layer requests sent by user clients to a virtual address common to the  
17        cluster, the method comprising:

18        dynamically determining, by the control client, which server nodes are  
19        members of the load-balancing cluster;

20        monitoring application-layer availability of the server nodes in the load-  
21        balancing cluster, the monitoring being performed by the control client generating  
22        and sending, from outside of the load-balancing cluster application-layer, requests  
23        to those server nodes determined to be members of the load-balancing cluster; and

24        in accordance with the application-layer availability of a server node in the  
25        load-balancing cluster as determined by the application-layer monitoring of the  
26        control client, sending to the load-balancing cluster a message that is configured to

control whether the server node handles application-layer requests sent to the load-balancing cluster by the user clients, where the application-layer requests sent by the control client to monitor application-layer availability conform to a same application-layer protocol that the user client requests conform to.

Gossler and/or Mangipudi do not teach or suggest the combination of feature(s) recited in claim 1. For example, Gossler and/or Mangipudi do not teach or suggest “dynamically determining, by the control client, which server nodes are members of the load-balancing cluster”, “monitoring application-layer availability of the server nodes in the load-balancing cluster, the monitoring being performed by the control client generating and sending, from outside of the load-balancing cluster application-layer, requests to those server nodes determined to be members of the load-balancing cluster” and “in accordance with the application-layer availability of a server node in the load-balancing cluster as determined by the application-layer monitoring of the control client, sending to the load-balancing cluster a message that is configured to control whether the server node handles application-layer requests sent to the load-balancing cluster by the user clients, where the application-layer requests sent by the control client to monitor application-layer availability conform to a same application-layer protocol that the user client requests conform to”, as recited in claim 1.

To the contrary, Gossler pertains generally to dynamic workload balancing. Gossler describes a technology for dynamically controlling the number of servers in a transaction system comprising at least one service unit for processing service requests (*Gossler*, Abstract). Each service unit comprises a queue for receiving and queuing the incoming service requests and a plurality of servers for executing the service requests (*Gossler*, col. 2 lines 55-60). A queuing monitor monitors and

1 controls the servers for each one of the service units of the service point (*Gossler*,  
2 col. 3 lines 10 – 21). Further, the queuing monitor provides a dynamic workload  
3 balancing method to employ an optimized number of servers for each service unit  
4 to be monitored (*Gossler*, col. 4 lines 41-43). The Office cites *Gossler* for  
5 teaching a method comprising determining present members of a load-balancing  
6 cluster.

7 However, claim 1 as amended recites “dynamically determining, by the  
8 control client, which server nodes are members of the load-balancing cluster”,  
9 “monitoring application-layer availability of the server nodes in the load-balancing  
10 cluster, the monitoring being performed by the control client generating and  
11 sending, from outside of the load-balancing cluster application-layer, requests to  
12 those server nodes determined to be members of the load-balancing cluster” and  
13 “in accordance with the application-layer availability of a server node in the load-  
14 balancing cluster as determined by the application-layer monitoring of the control  
15 client, sending to the load-balancing cluster a message that is configured to control  
16 whether the server node handles application-layer requests sent to the load-  
17 balancing cluster by the user clients, where the application-layer requests sent by  
18 the control client to monitor application-layer availability conform to a same  
19 application-layer protocol that the user client requests conform to.” *Gossler* fails  
20 to disclose the features of claim 1.

21 In addition to the foregoing, the Office recognizes that *Gossler* fails to  
22 disclose “dynamically determining present members of a load-balancing cluster  
23 which includes nodes and a node manager” and “monitoring application-layer  
24 availability of one or more members of the cluster, the monitoring being  
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1 performed by one or more clients outside of the cluster which are  
2 communicatively linked to the node manager in the cluster, such that the  
3 monitoring is from a client perspective to detect an error that may impact the  
4 application-layer availability as it appears to the one or more clients from outside  
5 of the cluster.” The Office then relies on Mangipudi as curing the deficiencies of  
6 Gossler (*Office Action*, p. 4).

7 Mangipudi pertains generally to a method and apparatus for policy based  
8 class of service and adaptive service level management within the context of an  
9 internet and intranet. Mangipudi describes a technology which facilitates  
10 categorization and routing of Web traffic based on Class of Service (COS)  
11 (*Mangipudi*, Abstract). Mangipudi describes that host computers can be grouped  
12 into different clusters (or classes) to facilitate provision of differentiated services.  
13 One of these host computers, referred to as the routing host 200, includes a policy  
14 engine 210, and is capable of receiving requests from client devices 202  
15 (*Mangipudi*, col. 9 lines 1-6). An incoming request from a client device 202 is  
16 received by the routing host 200 which then assigns a class to the request  
17 (*Mangipudi*, col. 9 lines 20-25). The policy engine 210 in conjunction with the  
18 routing host 200 then distributes the incoming traffic to the most available server  
19 206 for that class (*Mangipudi*, col. 9 lines 20-25).

20 The Office cites col. 4 lines 28-65 of Mangipudi as teaching “a system of  
21 load-balancing which includes nodes and a node manager where the application  
22 layer of the servers and their availability are dynamically determined and  
23 monitored from a routing host located outside of the cluster.” The Office further  
24 argues that “the monitoring being performed by the routing host outside of the  
25

1 cluster which is communicatively linked to the node manager in the cluster, such  
2 that the monitoring is from a client perspective to detect an error that may impact  
3 the application-layer availability as it appears to the routing host from outside of  
4 the cluster.” The Office compares an intelligent agent of Mangipudi to  
5 Applicants’ node manager 110, and compares routing host 200 of Mangipudi to  
6 Applicants’ one or more clients 132-138 (*Office Action*, p. 4-5; *Mangipudi* col. 4  
7 lines 28-65 and Figs. 2-3).

8 In Mangipudi, a monitoring engine at a router intercepts requests and  
9 communicates with agents at cluster nodes to balance load in the cluster. The  
10 router in Mangipudi does not originate requests, nor would this be expected in a  
11 router. Furthermore, the router in Mangipudi does not send messages to the  
12 cluster to balance load (or, as in claim 1, to control whether a node accepts  
13 requests). Rather, the same router performs the load balancing itself by routing  
14 requests to nodes according to load balancing needs determined at the router.  
15 Because the router performs the load balancing, there is no need to send a message  
16 to the cluster to control whether a node accepts requests.

17 Applicant submits that Mangipudi fails to cure the deficiencies of Gossler.  
18 Mangipudi does not describe “dynamically determining, by the control client,  
19 which server nodes are members of the load-balancing cluster”, “monitoring  
20 application-layer availability of the server nodes in the load-balancing cluster, the  
21 monitoring being performed by the control client generating and sending, from  
22 outside of the load-balancing cluster application-layer, requests to those server  
23 nodes determined to be members of the load-balancing cluster” and “in  
24 accordance with the application-layer availability of a server node in the load-  
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1 balancing cluster as determined by the application-layer monitoring of the control  
2 client, sending to the load-balancing cluster a message that is configured to control  
3 whether the server node handles application-layer requests sent to the load-  
4 balancing cluster by the user clients, where the application-layer requests sent by  
5 the control client to monitor application-layer availability conform to a same  
6 application-layer protocol that the user client requests conform to”, as recited in  
7 claim 1.

8 Accordingly, claim 1 is allowable over the Gossler and Mangipudi  
9 combination for at least the reasons described above, and Applicant respectfully  
10 requests that the §103 rejection be withdrawn.

11  
12 **Claims 3-13, 15 and 20** are allowable over the Gossler-Mangipudi  
13 combination by virtue of their dependency upon allowable claim 1.

14  
15 **Claims 14 and 16-19** are allowable over the Gossler-Mangipudi  
16 combination by virtue of their dependency upon allowable claim 1. Claims 14 and  
17 16-19 are also allowable over the Gossler-Mangipudi-Luzzi combination because  
18 Luzzi does not address the deficiencies of the Gossler-Mangipudi combination as  
19 described above in response to the rejection of claim 1.  
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1        **Independent Claim 21** recites a method performed by a control client that  
2 communicates with a load-balancing cluster of server nodes configured to service  
3 application-layer requests sent by user clients to a virtual address common to the  
4 cluster, the method comprising:

5            monitoring application-layer availability of the server nodes in the load-  
6 balancing cluster, the monitoring being performed by the control client generating  
7 and sending, from outside of the load-balancing cluster application-layer, requests  
8 to those server nodes determined to be members of the load-balancing cluster; and

9            in accordance with the application-layer availability of a server node in the  
10 load-balancing cluster as determined by the application-layer monitoring of the  
11 control client, sending to the load-balancing cluster a message that is configured to  
12 control whether the server node handles application-layer requests sent to the load-  
13 balancing cluster by the user clients, where the application-layer requests sent by  
14 the control client to monitor application-layer availability conform to a same  
15 application-layer protocol that the user client requests conform to.

16            Gossler and/or Mangipudi do not teach or suggest the combination of  
17 feature(s) recited in claim 21. For example as described above in response to the  
18 rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest  
19 “monitoring application-layer availability of the server nodes in the load-balancing  
20 cluster, the monitoring being performed by the control client generating and  
21 sending, from outside of the load-balancing cluster application-layer, requests to  
22 those server nodes determined to be members of the load-balancing cluster” and  
23 “in accordance with the application-layer availability of a server node in the load-  
24 balancing cluster as determined by the application-layer monitoring of the control  
25 client, sending to the load-balancing cluster a message that is configured to control  
whether the server node handles application-layer requests sent to the load-  
balancing cluster by the user clients, where the application-layer requests sent by



1 the control client to monitor application-layer availability conform to a same  
2 application-layer protocol that the user client requests conform to", as recited in  
3 claim 21.

4 Claim 21 has been rejected by the Office for the same reasons as it rejects  
5 claims 1 above. Applicant submits claim 21 is allowable over the Gossler-  
6 Mangipudi combination for at least the reasons described above in response to the  
7 rejection of claims 1.

8  
9 Claims 22-32, 34 and 37 are allowable over the Gossler-Mangipudi  
10 combination by virtue of their dependency upon allowable claim 21.

11  
12 Claims 33 and 35-36 are allowable over the Gossler-Mangipudi  
13 combination by virtue of their dependency upon allowable claim 21. Claims 33  
14 and 35-36 are also allowable over the Gossler-Mangipudi-Luzzi combination  
15 because Luzzi does not address the deficiencies of the Gossler-Mangipudi  
16 combination as described above in response to the rejection of claim 1.

17  
18 Independent Claim 38 recites a tangible computer-readable medium  
19 having computer-executable instructions that, when executed by a computer,  
20 perform a method performed by a control client that communicates with a load-  
21 balancing cluster of server nodes configured to service application-layer requests  
22 sent by user clients to a virtual address common to the cluster, the method  
23 comprising:  
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1 dynamically determining, by the control client, which server nodes are  
2 members of the load-balancing cluster;

3 monitoring application-layer availability of the server nodes in the load-  
4 balancing cluster, the monitoring being performed by the control client generating  
5 and sending, from outside of the load-balancing cluster application-layer, requests  
6 to those server nodes determined to be members of the load-balancing cluster; and

7 in accordance with the application-layer availability of a server node in the  
8 load-balancing cluster as determined by the application-layer monitoring of the  
9 control client, sending to the load-balancing cluster a message that is configured to  
10 control whether the server node handles application-layer requests sent to the load-  
11 balancing cluster by the user clients, where the application-layer requests sent by  
12 the control client to monitor application-layer availability conform to a same  
13 application-layer protocol that the user client requests conform to.

14 Gossler and/or Mangipudi do not teach or suggest the combination of  
15 feature(s) recited in claim 38. For example as described above in response to the  
16 rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest  
17 “dynamically determining, by the control client, which server nodes are members  
18 of the load-balancing cluster” as recited in claim 38. Further, as described above  
19 in response to the rejection of claims 1 and 21, Gossler and/or Mangipudi do not  
20 teach or suggest “monitoring application-layer availability of the server nodes in  
21 the load-balancing cluster, the monitoring being performed by the control client  
22 generating and sending, from outside of the load-balancing cluster application-  
23 layer, requests to those server nodes determined to be members of the load-  
24 balancing cluster” and “in accordance with the application-layer availability of a  
25 server node in the load-balancing cluster as determined by the application-layer  
monitoring of the control client, sending to the load-balancing cluster a message  
that is configured to control whether the server node handles application-layer  
requests sent to the load-balancing cluster by the user clients, where the

1 application-layer requests sent by the control client to monitor application-layer  
2 availability conform to a same application-layer protocol that the user client  
3 requests conform to”, as recited in claim 38.

4 Claim 38 has been rejected by the Office for the same reasons as it rejects  
5 claims 1 and 10 above. Applicant submits that claim 38 is allowable over the  
6 Gossler-Mangipudi combination for at least the reasons described above in  
7 response to the rejection of claims 1 and 10.

8  
9 **Independent Claim 39** recites a system comprising:

10 a control client that communicates with a load-balancing cluster of server  
11 nodes configured to service application-layer requests sent by user clients to a  
virtual address common to the cluster;

12 a dynamic cluster-membership determiner configured to exocusterly and  
13 dynamically determine, by the control client, which server nodes are members of  
14 the load-balancing cluster;

15 an exocluster monitor configured to monitor application-layer availability  
16 of the server nodes in the load-balancing cluster, the monitoring being performed  
17 by the control client generating and sending, from outside of the load-balancing  
cluster application-layer, requests to those server nodes determined to be members  
of the load-balancing cluster; and

18 in accordance with the application-layer availability of a server node in the  
19 load-balancing cluster as determined by the application-layer monitoring of the  
20 control client, sending to the load-balancing cluster a message that is configured to  
21 control whether the server node handles application-layer requests sent to the load-  
balancing cluster by the user clients, where the application-layer requests sent by  
22 the control client to monitor application-layer availability conform to a same  
application-layer protocol that the user client requests conform to.

23 Gossler and/or Mangipudi do not teach or suggest the combination of  
24 feature(s) recited in claim 39. For example as described above in response to the  
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1 rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest “a dynamic  
2 cluster-membership determiner configured to exocusterly and dynamically  
3 determine, by the control client, which server nodes are members of the load-  
4 balancing cluster” as recited in claim 39. Further, as described above in response  
5 to the rejection of claims 1 and 21, Gossler and/or Mangipudi do not teach or  
6 suggest “an exocuster monitor configured to monitor application-layer availability  
7 of the server nodes in the load-balancing cluster, the monitoring being performed  
8 by the control client generating and sending, from outside of the load-balancing  
9 cluster application-layer, requests to those server nodes determined to be members  
10 of the load-balancing cluster” and “in accordance with the application-layer  
11 availability of a server node in the load-balancing cluster as determined by the  
12 application-layer monitoring of the control client, sending to the load-balancing  
13 cluster a message that is configured to control whether the server node handles  
14 application-layer requests sent to the load-balancing cluster by the user clients,  
15 where the application-layer requests sent by the control client to monitor  
16 application-layer availability conform to a same application-layer protocol that the  
17 user client requests conform to”, as recited in claim 39.

18 Claim 39 has been rejected by the Office for the same reasons as it rejects  
19 claims 1, 4, 7, and 10 above. Applicant submits that claim 39 is allowable over  
20 the Gossler-Mangipudi combination for at least the reasons described above in  
21 response to the rejection of claims 1, 4, 7, and 10.

22 **Claims 41-43** are allowable over the Gossler-Mangipudi combination by  
23 virtue of their dependency upon allowable claim 39.  
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1        **Claims 44-45** are allowable over the Gossler-Mangipudi combination by  
2 virtue of their dependency upon allowable claim 39. Claims 44-45 are also  
3 allowable over the Gossler-Mangipudi-Luzzi combination because Luzzi does not  
4 address the deficiencies of the Gossler-Mangipudi combination as described above  
5 in response to the rejection of claim 39.

6  
7        **Independent Claim 46** recites a system comprising:

8            a control client that communicates with a load-balancing cluster of server  
9 nodes configured to service application-layer requests sent by user clients to a  
10 virtual address common to the cluster;

11           an exocuster monitor configured to monitor application-layer availability  
12 of the server nodes in the load-balancing cluster, the monitoring being performed  
13 by the control client generating and sending, from outside of the load-balancing  
14 cluster application-layer, requests to those server nodes determined to be members  
15 of the load-balancing cluster; and

16           in accordance with the application-layer availability of a server node in the  
17 load-balancing cluster as determined by the application-layer monitoring of the  
18 control client, sending to the load-balancing cluster a message that is configured to  
19 control whether the server node handles application-layer requests sent to the load-  
20 balancing cluster by the user clients, where the application-layer requests sent by  
21 the control client to monitor application-layer availability conform to a same  
22 application-layer protocol that the user client requests conform to.

23           Gossler and/or Mangipudi do not teach or suggest the combination of  
24 feature(s) recited in claim 46. For example as described above in response to the  
25 rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest “an  
exocuster monitor configured to monitor application-layer availability of the  
server nodes in the load-balancing cluster, the monitoring being performed by the  
control client generating and sending, from outside of the load-balancing cluster

1 application-layer, requests to those server nodes determined to be members of the  
2 load-balancing cluster” and “in accordance with the application-layer availability  
3 of a server node in the load-balancing cluster as determined by the application-  
4 layer monitoring of the control client, sending to the load-balancing cluster a  
5 message that is configured to control whether the server node handles application-  
6 layer requests sent to the load-balancing cluster by the user clients, where the  
7 application-layer requests sent by the control client to monitor application-layer  
8 availability conform to a same application-layer protocol that the user client  
9 requests conform to”, as recited in claim 46.

10 Claim 46 has been rejected by the Office for the same reasons as it rejects  
11 claims 1, 3-4, 6-7 and 10 above. Applicant submits that claim 46 is allowable over  
12 the Gossler-Mangipudi combination for at least the reasons described above in  
13 response to the rejection of claims 1, 3-4, 6-7 and 10.

14  
15 **Claims 47-51** are allowable over the Gossler-Mangipudi combination by  
16 virtue of their dependency upon allowable claim 46.

17  
18 **Claims 52-53** are allowable over the Gossler-Mangipudi combination by  
19 virtue of their dependency upon allowable claim 46. Claims 52-53 are also  
20 allowable over the Gossler-Mangipudi-Luzzi combination because Luzzi does not  
21 address the deficiencies of the Gossler-Mangipudi combination as described above  
22 in response to the rejection of claim 46.  
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1  
2 **Independent Claim 54** recites a dynamic, active, exocluster monitoring  
3 system for monitoring application-layer availability of server nodes in a load-  
4 balancing cluster and for controlling an activity state of such server nodes, the  
5 monitoring system comprising:

6 a control client that communicates with a load-balancing cluster of server  
7 nodes configured to service application-layer requests sent by user clients to a  
8 virtual address common to the cluster;

9 an app-monitor configured to exoclusterly monitor application-layer  
10 availability of the server nodes in the load-balancing cluster, the monitoring being  
11 performed by the control client generating and sending, from outside of the load-  
12 balancing cluster application-layer, requests to those server nodes determined to  
13 be members of the load-balancing cluster; and

14 in accordance with the application-layer availability of a server node in the  
15 load-balancing cluster as determined by the application-layer monitoring of the  
16 control client, sending to the load-balancing cluster a message that is configured to  
17 control whether the server node handles application-layer requests sent to the load-  
18 balancing cluster by the user clients, where the application-layer requests sent by  
19 the control client to monitor application-layer availability conform to a same  
20 application-layer protocol that the user client requests conform to.

21 Gossler and/or Mangipudi do not teach or suggest the combination of  
22 feature(s) recited in claim 54. For example as described above in response to the  
23 rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest “a control  
24 client that communicates with a load-balancing cluster of server nodes configured  
25 to service application-layer requests sent by user clients to a virtual address  
common to the cluster”, “an app-monitor configured to exoclusterly monitor  
application-layer availability of the server nodes in the load-balancing cluster, the  
monitoring being performed by the control client generating and sending, from

1 outside of the load-balancing cluster application-layer, requests to those server  
2 nodes determined to be members of the load-balancing cluster”, and “in  
3 accordance with the application-layer availability of a server node in the load-  
4 balancing cluster as determined by the application-layer monitoring of the control  
5 client, sending to the load-balancing cluster a message that is configured to control  
6 whether the server node handles application-layer requests sent to the load-  
7 balancing cluster by the user clients, where the application-layer requests sent by  
8 the control client to monitor application-layer availability conform to a same  
9 application-layer protocol that the user client requests conform to”, as recited in  
10 claim 54.

11 Claim 54 has been rejected by the Office for the same reasons as it rejects  
12 claims 1 and 10 above. Applicant submits that claim 54 is allowable over the  
13 Gossler-Mangipudi combination for at least the reasons described above in  
14 response to the rejection of claims 1 and 10.

15  
16 **Claims 55-57** are allowable over the Gossler-Mangipudi combination by  
17 virtue of their dependency upon allowable claim 54. Claims 55-57 are also  
18 allowable over the Gossler-Mangipudi-Luzzi combination because Luzzi does not  
19 address the deficiencies of the Gossler-Mangipudi combination as described above  
20 in response to the rejection of claim 54.  
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Respectfully Submitted,

By: Shayne O'Reilly  
Shayne E. O'Reilly  
Lee & Hayes, PLLC  
Reg. No. 58,765  
(509) 324-9256 x 267